REMARKS

Claims 1-12 have been canceled and new claims 22-35 have been added so that claims 13-35 are now in the application.

New claim 22 is distinguished over Hayashi by reciting:

> "forming each of the pinned layer and the spacer layer with first and second side surfaces which are perpendicular to the head surface;
>
> forming first and second electrically nonconductive antiferromagnetic (AFM) layers with the first AFM layer interfacing the first side surfaces of the pinned and spacer layers and the second AFM layer interfacing the second side surfaces of the pinned and spacer layers so as to define a track width of the read head between said first and second side surfaces of the pinned and spacer layers;
>
> forming the free layer structure with first and second lateral extensions which extend laterally away from first and second side extremities respectively of said track width; and
>
> forming said first and second AFM layers exchange coupled to the first and second lateral extensions respectively commencing at said first and second side extremities of the track width respectively and extending laterally therefrom for longitudinally biasing the first and second lateral extensions respectively of the free layer structure and thence a central portion of the free layer structure within said track width."

This structure is exemplified in Applicants' Fig. 13 wherein each of the pinned layer 208 and the spacer layer 212 has first and second side surfaces which are perpendicular to the ABS, first and second electrically nonconductive antiferromagnetic (AFM) layers 224 and 226 with the first AFM layer 224 interfacing the first and second side surfaces of the pinned and spacer layers and the second AFM layer 226 interfacing the second side surfaces of the pinned and spacer layers so as to define a track width (TW) of the read head between the first and second side surfaces of the pinned and spacer layers, the free layer structure has first and second lateral extensions 242 and 244, which extend laterally away from first and second side extremities respectively of the track width (TW), and the first and second AFM layers 224 and 226 are exchange coupled to the first and second lateral extensions 242 and 244, respectively, commencing at said first and second side extremities of the track width, respectively, and extending laterally therefrom for longitudinally biasing the first and

second lateral extensions 242 and 244, respectively, of the free layer structure. In contrast, Hayashi employs his insulation layers 26 for defining the track width by interfacing side surfaces of the pinned layer 22, the AFM pinning layer 24 and a cap layer 25, but does not interface side surfaces of the spacer layer 20. Of significance then is that the biasing layers 161 and 162 interface end portions of the free layer 18 which are spaced from the left and right extremities of the track width. This spacing permits longitudinal biasing of the free layer 18 to leak into the shield layer 14 which will reduce longitudinal biasing of the free layer 18 within the track width. The Applicants obviate this problem by exchange coupling the first and second AFM layers 224 and 226 to the lateral extensions 242 and 244 of Applicants' free layer structure *commencing at the first and second side extremities of the track width (TW)* so that magnetization of the first and second lateral extensions 242 and 244 do not magnetically leak to the shield layer 238 before longitudinally stabilizing the free layer portion 240 within the track width (TW). Claims 24-29, which are dependent upon claim 22, are considered to be patentable over Hayashi for the same reasons as given in support for claim 22. Claim 30, which recites similar limitations as claim 22, is considered to be patentable over Hayashi for the same reasons as given in support for claim 22. Claims 32-35, which are dependent upon claim 30, are considered to be patentable over Hayashi for the same reasons as given in support for claim 30.

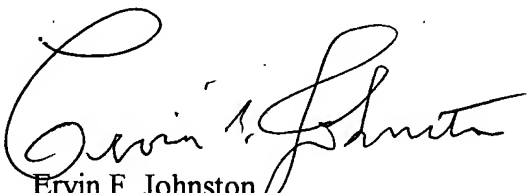
Claim 23, which is dependent upon claim 22, is further distinguished over Hayashi by reciting:

> "forming the free layer structure with first and second free layers;
> forming the first free layer within said track width and with first and second side surfaces that are coextensive with the first and second side surfaces respectively of the spacer layer;
> forming the first and second AFM layers also interfacing the first and second side surfaces respectively of the first free layer; and
> forming the second free layer with said central portion and further with said first and second lateral extensions of the free layer structure ."

This structure is exemplified in Fig. 13 wherein the free layer structure has first and second free layers 214 and 240 wherein the first free layer 214 is located within the track width with first and second side surfaces that are coextensive with the first and second side surfaces, respectively, of the spacer layer 212, wherein the first and second AFM layers 224 and 226 also interface the first and second side surfaces, respectively, of the first free layer 214 and the second free layer 240 has the central portion and further has the first and second lateral extensions 242 and 244 of the free layer structure. By providing first and second free layers 214 and 240 this permits minimizing the thickness of the lateral extensions 242 and 244 of the second free layer.

Should the Examiner have any questions regarding this document he is respectfully requested to contact the undersigned.

Respectfully submitted,



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